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[54] **HUMAN SPINAL DISC PROSTHESIS WITH HINGES**

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[*] Notice: This patent is subject to a terminal disclaimer.

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Related U.S. Application Data

[63] Continuation-in-part of application No. 08/681,230, Jul. 22, 1996, Pat. No. 5,674,296, which is a continuation-in-part of application No. 08/339,490, Nov. 14, 1994, abandoned.

[51] Int. Cl.⁶ **A61F 2/44**

[52] U.S. Cl. **623/17; 606/61**

[58] Field of Search **623/16, 17, 18; 606/60, 61, 70-73**

References Cited

U.S. PATENT DOCUMENTS

2,677,369	5/1954	Knowles	623/17
4,309,777	1/1982	Patil	623/17
4,599,086	7/1986	Doty	623/17
4,759,766	7/1988	Buettner-Janz et al.	623/17
4,759,769	7/1988	Hedman et al.	623/17

(List continued on next page)

FOREIGN PATENT DOCUMENTS

0176728	4/1986	European Pat. Off.	A61F 2/44
000560140 A1	9/1993	European Pat. Off.	A61F 2/44
2 263 842	7/1974	Germany	A61F 1/00
3 023 353	4/1981	Germany	623/17
1560184 A1	4/1990	U.S.S.R.	A61F 2/44
895433	1/1992	U.S.S.R.	623/17

OTHER PUBLICATIONS

"The Occurrence of Optic Neuritis in Lesions of the Spinal Cord, Injury, Tumor, Melitis;" Taylor, Collier; Brain: A Journal of Neurology; vol. 24; Macmillan & Co. Ltd., 1901; pp. 532-550.

"The Results of Anterior Interbody Fusion of the Cervical Spine;" Robinson et al.; The Journal of Bone & Joint Surgery; vol. 44-A, No. 8, Dec. 1962; pp. 1569-1587.

"Natural History & Prognosis of Cervical Spondylosis;" Lees et al.; British Medical Journal; Dec. 28, 1963; British Medical Association, London, England; Copyright 1963; pp. 1607-1610.

"The Neurological Manifestations of Cervical Spondylosis;" Brain et al.; Brain, Journal of Neurology vol. 75; Macmillan & Co.; 1952; pp. 187-225.

"Cervical Disc Disease;" Simeone and Rothman; Pennsylvania Hospital & University of Pennsylvania; 1975; pp. 387-433.

(List continued on next page.)

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[57] **ABSTRACT**

The invention relates to a spinal disc endoprosthesis. The endoprosthesis has a resilient body formed of one or more materials which may vary in stiffness from a relatively stiff exterior annular gasket portion to a relatively supple central nucleus portion. Concave-convex elements at least partly surround that nucleus portion so as to retain the nucleus portion and gasket between adjacent vertebral bodies in a patient's spine. Assemblies of endoprosthetic discs, endoprosthetic vertebral bodies, and endoprosthetic longitudinal ligaments may be constructed. To implant this endoprosthesis assembly, information is obtained regarding the size, shape, and nature of a patient's damaged spine. Thereafter, one or more prosthetic vertebral bodies and disc units are constructed in conformity with that information. Finally, the completed and conformed vertebral body and disc assembly is implanted in the patient's spine.

20 Claims, 10 Drawing Sheets

